

*Wk Ord II  
to OL 9/25/59*

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In replying please address:



25X1

September 18, 1959

Dear Sir:

In accord with recent discussions with your technical representative, we are herewith submitting a proposed program of research directed toward the study of additional selected changes in the experimental air-film-cooled incinerator for the destruction of papers and documents, that is currently being investigated under Task Order No. Z.

The experimental air-film-cooled incinerator which has been under development under Task Order No. Z has reached the stage where the major requirements of your technical representatives have generally been satisfied. The first experimental unit was provided to your technical representatives in July, 1959, for further evaluation and demonstration. These demonstrations have evoked favorable reactions with regard to the performance of the experimental unit. However, a comment from a few observers has been that a further reduction in the emission of the fly ash probably would be required for acceptable use of the experimental unit in geographical areas where the relatively small amount of fly ash being emitted during the operation of this unit might be considered objectionable.

In the current effort under Task Order No. Z, an additional experimental air-film-cooled incinerator, which incorporates selected modifications mutually considered to be favorable, is under preparation.

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25X1

-2-

September 18, 1959

Also, other changes in the design are being studied. Thus, an investigation is being directed toward providing a suitable protective grating for the grid in order to minimize the accumulation and burning of paper on the grid and thus reduce the possibility of carburization and resulting premature failure of the grid.

During recent discussions with your technical representative, consideration was given to relatively simple and inexpensive methods for separating some of the fly ash from the effluent before the stack gases are discharged to the atmosphere. An idea for a simple experimental "fly-ash skimmer" was suggested, discussed, and mutually agreed upon as representing a promising initial attack on the fly-ash problem. Also discussed was the advisability of conducting a few additional experiments in connection with the development of a protective grating for the grid.

In addition, your technical representative suggested that, toward the end of the current research period, it would be worth while to investigate the performance of the experimental air-film-cooled unit set up in an office-type room with the stack exiting through a window or an opening in the wall. For these trial experiments, your technical representative indicated that the blower should be driven with a small auxiliary gasoline engine, in an effort to demonstrate the feasibility of operating the experimental incinerator without utility power.

The currently contemplated method of procedure for the research program proposed herein is outlined in the following.

A preliminary study would be directed toward separating and collecting an appreciable portion of the fly ash which is normally emitted from the operating experimental incinerator in the stack gases. The normal

-3-

September 18, 1959

swirl pattern of the gases leaving the operating experimental unit results in a concentration of fly-ash particles, especially the larger sizes, in the portion of the stack cross-sectional area that is closest to the wall. Thus, it appears that an experimental skimmer-type separator and collector merits investigation in an attempt to eliminate a significant amount of the fly ash. A concentric thimble of slightly smaller diameter pipe would be inserted in the stack, and it is expected that the small fraction of the total gas flow which entered the outer annulus would contain an appreciable portion of the total fly ash. The gases flowing through this outer annulus would be separated from the main flow by suitable ducting, and then led into a cyclone collector which would be much smaller (perhaps only 10 per cent of the size) than the type of unit which would be required to handle the total flow of the stack gases from the experimental incinerator. The exit gases from the cyclone collector could eventually be ducted back into the main stack downstream from the experimental skimmer; but, during the proposed experiments, a separate discharge pipe would be used to permit observation and examination of the residual fly ash and measurement of the gas flow. The pressure drop sustained in the cyclone collector would be compensated for either by increasing the static pressure in the operating experimental incinerator or by using a small exhausting blower at the discharge of the cyclone collector.

A limited amount of effort would be expended in evaluating the effectiveness of the experimental skimmer-type separator and collector. Experiments would be performed using three different flow rates of gas through the annulus of the experimental skimmer-type separator. It is

-4-

September 18, 1959

expected that consideration of the weight of the fly ash collected in the cyclone compared to the total weight of the ash in the paper burned, and visual observation of the discharge from the main stack would provide sufficient data for a preliminary evaluation of this method.

If the preliminary results obtained with the experimental skimmer-type separator and collector are favorable, then the desirability of conducting additional research directed toward the further development of such an experimental device would be discussed with your technical representatives. It is likely that such an additional effort would have to be set up under another contractual arrangement.

Also, additional consideration would be given to the protection of the grid by means of some type of grating.

It is also contemplated that an evaluation would be made of the operation of the experimental incinerator equipped with an auxiliary gasoline-engine drive for the blower and located in an office-type room. Suitable space would be selected after further discussion with your technical representative and a temporary stack would be provided for the discharge of the stack gases through the wall or window. In the present experimental blower-motor set up, the blower wheel is mounted directly on the shaft of the 3,500-rpm electric motor and cannot be readily adapted to a gasoline-engine drive. Consequently, it is currently planned that another blower with the same housing dimensions as previously but equipped with a stub shaft and belt pulley would be purchased and set up with an appropriate gasoline engine. It is likely that a #25 NW Industrial Exhauster, Arrangement 4, that will handle 2,400 CFM at 1" SP, available from the Buffalo Forge Company, and a Model AENL "Wisconsin" 4-cycle, single-cylinder,

-5-

September 18, 1959

9.2-hp, air-cooled gasoline engine, available locally, would be purchased and utilized in the above-described application. The performance of the experimental incinerator under the above-indicated conditions would be evaluated by running the unit for approximately two days and comparing the performance data with those obtained previously from the experimental incinerators equipped with electric-motor and blower units. It is anticipated that your technical representative would be on hand to participate in this evaluation.

If, as expected, the results of the effort involving the gasoline-motor and blower unit are favorable, the unit would be provided to your technical representatives. Every effort would be made to expedite the investigation of the effectiveness of this gasoline-motor and blower unit, so as to be able to make it available to your technical representatives as soon as possible after the current Task Order No. Z experimental incinerator is furnished to them.

Your technical representative would be kept informed of the progress of the proposed research by discussions during periodic visits and via telephone. At the conclusion of the proposed research period, a summary letter report would be submitted that described the results of the research activity.

We propose to undertake this effort over a period of two months, starting on the date of acceptance of authorization from the Contracting Officer to proceed. The proposed research program could be conducted under Task Order No. KK. The Work Order would be a period-basis research agreement; it could be similar in form to that used previously under Task Order No. KK and the same administrative procedures would be followed.

-6-

September 18, 1959

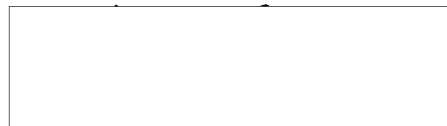
The Work Order would require only that the research be directed toward the objective outlined above, within the limits of the time and funds provided.

It is estimated that an appropriation of \$2,993, including the fixed fee, is needed to fund the proposed program for the two-month period. A general breakdown of the estimated costs is attached.

To aid in expediting the performance of the proposed research, it is recommended that the Contracting Officer, in a letter accompanying the proposed contract, grant express approval for the procurement of a blower (exhauster) and a gasoline engine as described above. It is currently estimated that the blower would cost approximately \$200, and the gasoline engine, approximately \$170. Also, expeditious consideration of this proposed program of research would be appreciated.

If any additional information is needed, please do not hesitate to call us. You may direct any inquiries of a contractual nature to Mr. V. E. Young, at Extension 159.

Very truly yours,



Vice President

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EMS:th

In Duplicate

Proposal of  the U. S. Government.

For Research on **The Investigation of Additional Selected Changes for the Task Order No. 2 Experimental Incinerator.**

Based upon a period-basis Contract for a research period of **two months.**

(Including time for submission of all reports. The proposed contract will not provide for earlier conclusion of the research.)

### ESTIMATED COSTS

We expect that the cost of this research for the period indicated above may be distributed approximately as set forth hereon, subject to the understanding that this allocation is merely an estimate, and actual costs incurred may vary from the categories shown. We have determined that these estimates are reasonable and consistent with  established policies in its research for the various Government agencies, which policies are briefly discussed below and will be followed in determination of our actual costs hereunder.

#### Materials & Supplies, etc.

**\$ 450**

(Including any equipment which may be purchased as necessary in performance of the research. Charges of \$25 or less are excluded from this item.)

#### Use of Equipment and Technical Services, Travel, and Misc.

**\$ 270**

(Including applicable costs of technical research and service divisions, and use of technical equipment, except that any undistributed balances of these accounts will be included in overhead. Cost of travel includes reasonable actual subsistence expenses and the actual cost of transportation. An allowance of up to 8¢ per mile for all necessary travel by privately owned conveyance is included in lieu of the cost of such travel.)

#### Salaries & Wages

(Including our predetermined accrual for vacation, holiday, and sick-leave pay, pensions, and social security.)

Type of Employee	No. of Man-Months	Estimated Cost
Supervision	1/4	\$250
Research Engineers	1	750
Lab. Assistants	3/4	315
Steno., Clerical, Shop & Photo., etc.	Nominal	Nominal
Total Salaries & Wages		<b>\$1,315</b>

#### Overhead

60 per cent of salaries and wages, as they are defined above. Provisional monthly reimbursement will be at the rate of 60 per cent of salaries and wages, as so defined, or at such other provisional rate as may from time to time be mutually agreed upon with the Government's audit representatives. This is a provisional rate for current reimbursement, which we have arrived at by negotiation with Government representatives, and it will be subject to retroactive revision to the "actual" rate agreed upon with them for each calendar year following a detailed audit for that year. The item of overhead includes general research, charges of \$25 or less for materials and supplies, and other categories of costs we customarily include in our overhead account. Cash discounts on all purchases will be credited to overhead, instead of to the amount of the purchase. Scrap of appreciable value will be credited directly to the project. All other scrap will be credited to the overhead account, in which the Government participates.)

**\$ 789**

Total Estimated Cost **\$2,824**

Fixed Fee **\$ 169**

Contract Price **\$2,993**

\*Please let us have your acceptance in our hands by **November 2, 1956**.  
Unless we extend the time, your acceptance after that date will be subject to agreement.

10/57